3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

The following sections describe the environmental resources that could be affected by the proposed action, potential impacts to those resources, and mitigation measures that would reduce the severity of those impacts. The resources include those that are typically evaluated under both NEPA and CEQA, as well as those that are generally required for NEPA documents, such as socioeconomics, transboundary impacts, environmental justice, and energy and depletable resources. Significance criteria for evaluating impacts to resources that are considered under both NEPA and CEQA have been provided. They are based on CEQA Guidelines, Appendix G, and modified where appropriate to address impacts specific to the proposed action. NEPA does not require the use of specific significance criteria, and specifies that the description of their impacts is to be based on the context and intensity of the impacts and on the relationship between them. Thus, no significance criteria have been provided for those resources required only in an EIS.

Detailed analyses were not performed for resources for which there would be only minor impacts or no potential for environmental impacts. These include energy and depletable resources (section 3.6), population and housing (section 3.13), public utilities and services (section 3.14), and transportation (section 3.19). Each of these sections contains an explanation regarding why impacts would not occur.

Sections addressing resources that are considered in detail include a description of the affected environment and the environmental consequences of each alternative evaluated. Where appropriate, individual descriptions of the affected environment are provided for the planning area (applicable to Alternatives 1-3) and the three off-site conservation areas (applicable to Alternative 4). Impacts to some resources, such as socioeconomics and air quality, may affect a broader region than others, and the description of the affected environment for these resources is necessarily broader, as well. Environmental consequences are identified for each alternative. Each impact (i.e., less than significant, significant, and beneficial impacts) is given an alphanumeric number. These discussions are preceded, where appropriate, by a description of impacts that were considered but found to be minor. Mitigation measures also are given an alphanumeric number and are provided where necessary. The discussion of mitigation measures is followed by description of the residual impacts that would occur after the implementation of the mitigation measures.

OVERVIEW OF THE PLANNING AREA

The planning area includes seven reaches of the LCR, extending from Lake Mead to the SIB, and includes Federal, state, tribal, and private lands. The planning area is bounded by La Paz, Mohave, and Yuma counties in Arizona; Imperial, Riverside, and San Bernardino counties in California; and Clark County, Nevada. Of the approximately 716,230 acres (1,119 square miles) in the seven reaches of the LCR planning area, approximately 22,178 acres of urban/developed land are present, primarily in incorporated cities. These cities include Bullhead City, Lake Havasu City, Parker, San Luis, Somerton, and Yuma, Arizona; Blythe, and Needles, California;

and Laughlin, Nevada. Several Indian reservations are located along the LCR, as well, including those of the Chemehuevi, Cocopah, Colorado River Indian Tribes (CRIT), Fort Mojave, Fort Yuma-Quechan, and the Hualapai. The total population in the LCR planning area is approximately 106,000. Agriculture is one of the primary land uses in the planning area, comprising approximately 270,000 acres. The planning area also contains considerable open space and recreational uses, including a number of state and Federal parks and wildlife refuges.

Present conditions in the LCR are significantly different from historical conditions. The river is no longer free flowing and does not constitute a continuous ecosystem because of the many impoundments along its length. In addition, the hydrologic regime does not support extreme fluctuations mainly because of the presence of large, mainstem dams (e.g., Hoover Dam and Glen Canyon Dam) farther upstream, resulting in reduced natural backwaters and periods of inundation in adjacent floodplain lowlands. Reach 1 is defined by the boundary of Lake Mead when its water level is at 1,229 feet msl. Lake Mead, formed by Hoover Dam, traps Colorado River sediment not trapped in Lake Powell in its upper reaches, and the river downstream of the dam is relatively clear. Reach 2 extends from Hoover Dam to Davis Dam and is defined by the boundary of Lake Mohave when its water level is at 647 feet msl. Davis Dam and Lake Mohave were created to provide part of the capacity for water delivery to Mexico and to re-regulate fluctuating discharge from Hoover Dam. Additional sediments are trapped behind Davis Dam. Reach 3 extends from Davis Dam to Parker Dam and includes channelized river, a substantial marsh area, and Lake Havasu to its 450-foot msl. Immediately below Davis Dam, the system is characterized by a riverine reach controlled by the discharge from Davis Dam. Reach 4 extends from Parker Dam to Adobe Ruin and Reclamation's Cibola Gage. This reach is channelized. Reach 5 extends from southern extent of Cibola NWR and Reclamation's Cibola Gage to Imperial Dam. Imperial Dam created Imperial Reservoir and provides water to the Gila Gravity Main Canal in Arizona and the All-American Canal in California. Generally, Imperial Reservoir is warm and shallow. Reach 6 extends from Imperial Dam to the NIB and includes Laguna Dam, Mittry Lake, and the confluence with the Gila River. The Laguna Desilting Basin, which receives sediment from upstream sources, is periodically dredged. Flows in Reach 6 are minimal since mainstem water is diverted for irrigating agricultural lands. Reach 7 extends from the NIB to the SIB and includes Morelos Diversion Dam. Flows in this reach of the river vary. At times the lower part of the reach is dry. Cohen and Henges-Jeck (2001) reported average total flows in this reach of 22,000 af in non-flood years and 2,120,000 af in flood years. These flows are the result of seepage from Morelos Diversion Dam, flow releases from Morelos Diversion Dam (flood flows and excess water Mexico does not divert), irrigation return flows from Mexico, canal wasteways on the United States side of the border, and groundwater accumulation from both the United States and Mexico.

The vegetation within the planning area is also significantly different from historic conditions. Approximately 126,000 acres of woody riparian vegetation are present in the LCR planning area. Most of this is saltcedar (i.e., saltcedar, saltcedar–honey mesquite, and saltcedar–screwbean mesquite land cover types). Only 23,000 acres of native vegetative communities, including cottonwood-willow, honey mesquite, arrowweed, and atriplex, remain within the planning area. The LCR supports several hundred species of wildlife (birds, mammals, fish, reptiles, and amphibians), including both resident species and migratory visitors. A number of species that are Federally listed as threatened or endangered are known to occur or have the potential to occur along the LCR. Six of these are covered in the Conservation Plan. All of these species also are listed by one or more states along the river. The Conservation Plan also includes six species that are state-listed but not Federally listed, 13 species that are designated as species of special concern or protected in one or more states, and two species that have no current regulatory status but could become listed over the 50-year life of the LCR MSCP. Four other species are included in the Conservation Plan as "evaluation species" that could be proposed for coverage under the section 10(a)(1)(B) permit in the future.

TECHNICAL ASSUMPTIONS REGARDING IMPLEMENTATION OF THE CONSERVATION PLAN

The following summarizes the technical assumptions used to assess potential impacts of implementation of the Conservation Plan. While specific conservation area establishment locations and design and construction details have yet to be developed, for purposes of assessing the proposed action's environmental impacts, these are considered to be reasonable assumptions about the range of actions that would be required, the general types of equipment that would be used, and the implementation schedule. Actual implementation may vary.

Location of Conservation Area Establishment Actions

Conservation area establishment actions could be implemented on a combination of Federal, state, tribal, and private lands using agricultural or undeveloped lands. Since specific sites have not been selected, it is not known how much development would occur on either private, public, or tribal lands; nor it is known to what extent agricultural or undeveloped lands would be used. The impact analysis in this EIS/EIR is based on the identification of the impacts that could potentially result under reasonably foreseeable worst-case scenarios from the implementation of the Conservation Plan, as well as the mitigation measures that would avoid, minimize, restore, reduce, or compensate for the potential impacts. For example, the analysis for impacts to agricultural and socio-economic resources assumes that the established conservation areas would be constructed on lands taken out of agricultural production for that purpose, although it is probable that non-agricultural lands would be used. Most conservation opportunities have been identified in Reaches 3-5 of the LCR due to the presence of existing habitat and suitable landforms. Other reaches include constraints, such as steep canyons, which limit the feasibility of conservation area establishment.

Construction Schedule

It is estimated that sites that currently are in agriculture and require minimal grading and infrastructure can be completed within approximately 3 years. Sites that require the removal of saltcedar, grading, and the installation of irrigation and other infrastructure likely would require up to five years. These durations include planning, design, and permitting. Actual construction would take considerably less time. Construction generally would take place during daylight hours any day of the week, although dredging would probably occur 24 hours a day.

Clearing and Grading

Habitat establishment would likely require modification to existing site conditions. Clearing would involve removing existing non-native vegetation, primarily with heavy equipment, such as bulldozers with root plow attachments (use of prescribed fire to clear vegetation is addressed below). Actions would include clearing, deep plowing, root-ripping, tilling, and disking. Cleared vegetation could be trucked off-site and shredded and used as mulch. (Alternatively, it could be burned, as discussed below.) Undeveloped areas can be cleared at a rate of about 1-2.5 acres per day, depending on the density of existing vegetation. Agricultural lands can be cleared at a much faster rate. Hand clearing of some vegetation may occur on a limited basis using equipment such as weed-eaters. Additionally, chemical herbicides may be used to control non-native vegetation. Herbicides that are approved for use in the project area would be ordered for individual jobs and shipped to a licensed vendor, who would then apply them using accepted methods. Herbicides would be stored in accordance with appropriate standards at the field facilities described below or other existing facilities. They could be applied manually or aerially, depending on the size of the area to be cleared. Only vegetative material would be sprayed; herbicides would not be applied to open water. All state and Federal requirements to ensure public safety and environmental protection would be observed.

Grading would be required on both undeveloped and agricultural sites to provide suitable elevations for establishing habitat and to create access roads in some locations. Since agricultural land already is ready to plant and likely includes the necessary infrastructure, such as access roads and irrigation systems, it is assumed that agricultural sites would require approximately 1/5 of the grading of undeveloped sites (some grading would be needed to create mounds and depressions in order to provide micro-topographic diversity). Side slopes created for berms and access roads would be engineered for stability; the actual slope would depend upon the height of the slope and the composition of the graded material.

The BMPs of the state in which construction occurred would be used to control sedimentation in the vicinity of water bodies during ground-disturbing activities. Typical measures that could be used include the following:

- Providing for temporary pollution control measures such as dikes, basins, ditches, diversions, silt fences, and the application of straw and seed, to be functional prior to land disturbing activities;
- Minimizing the area to be cleared and graded to the extent possible;
- Constructing footings in water by the sheet pile cofferdam method and pumping water from within the dam to desilting ponds before returning it to the watercourse;
- Isolating the construction area by dikes and/or berms where necessary;
- Erecting barriers, covers, shields, and other protective devices as necessary to prevent any construction materials, equipment or contaminants/pollutants from falling or being thrown into a watercourse;
- Constructing drainage facilities with armoring when necessary to control erosion and sedimentation;
- Prohibiting the placement of oily or greasy substances originating from the contractor's operations where they would later enter a stream or watercourse;
- Storing and transporting fuel in appropriate safety containers.

- Mixing and loading hazardous materials in an accepted manner to prevent spills or leakage.
- Disposing of used containers in accordance with regulatory standards.

Prescribed Burns and Other Uses of Fire

Prescribed burns could be used to establish marshland approximately every seven to eight years. A less likely use of fire is to clear existing vegetation or, alternatively, to burn vegetation removed by mechanical methods. Prescribed burns would be conducted by the Interagency Fire Team (IFT), which is headed by the BLM. The Service and the BIA also are members of the IFT and are responsible for conducting prescribed burns on their own lands. Certain management practices would be followed prior to initiating prescribed burns, including developing measurable objectives, an approved prescription, and an escaped fire plan to be implemented in the event that a prescribed fire exceeded the limits of an approved prescription; using qualified personnel; identifying quantified ranges of conditions under which burns would be conducted (including such factors as wind direction and speed, relative humidity, temperature, atmospheric stability, and fuel moisture content); describing actions that would be taken if those conditions were exceeded; establishing a monitoring and documentation process; and establishing a review and approval process. All Federal, state, and local requirements would be followed, including air quality regulations, and coordination with the appropriate agencies would occur prior to initiating prescribed fires. Public notification also would occur at an appropriate interval before a fire was begun. Fires likely would be conducted in the late fall through early spring to avoid the breeding season of sensitive species and to take advantage of the optimal time for burning saltcedar and marsh vegetation.

Dredging

Hydraulic dredges would be used to establish 360 acres of backwaters. Amphibious trackhoes (excavators) would be used for clearing inlets and outlets. The exact size of backwaters would vary with site location, but for purposes of this analysis, it is assumed that individual backwaters would be a minimum of 10 acres each, and it is estimated that they would average about 6 feet in depth. Approximately 50 cubic yards (cy) per hour could be dredged. Dredged material could be disposed of onsite above the high-water mark and used for creating berms and contours or it could be sidecast into adjacent areas of the river. If dredged material were to be disposed at an upland site, it would be pumped into a bermed area, and the freshwater would be decanted and returned to the originating water body. Material discharged into the river eventually would be dredged as part of ongoing maintenance and disposed of at an upland site.

Field Facilities

Field facilities may be required, although the LCR MSCP participants would try to share existing facilities where possible. If not, no more than two facilities would be constructed, most likely in the Mohave Valley and Blythe. They could be constructed on private or public land in an already developed area. The facilities likely would consist of a small, prefabricated steel building that would serve as an office and an equipment yard to store tractors, dredges, or other heavy equipment and approved pesticides and fuel. These facilities would not be permanently staffed; rather, they would be used on an as-needed basis. Routine maintenance of the stored equipment could be performed at the facilities. These facilities would require several acres at most and would be fenced. They likely would be constructed on bare ground or at an already developed and graded site. Thus, minimal grading would be required. A concrete truck would be required to pour the building foundation, and a small crew would be needed to assemble the building. A trencher would be required to extend underground utilities such as gas and waterlines. Power lines would be placed overhead. Other equipment would likely include a road motor grader, one to two front-end loaders, one to two dump trucks, a backhoe/excavator, a crane/boom truck, and a forklift truck. Construction likely would last from 1 to 3 months, depending on the size of the site and site conditions.

Infrastructure

It is likely that electric pumps would be used where possible (e.g., where power is readily available) to provide water for irrigation. Diesel pumps could be used, as well, however, and for this analysis it is assumed that roughly half would be electric and half would be diesel. Approximately 0.09 kilowatt hours (kWh) would be required for every 1,000 gallons of pumped water, and up to approximately 6 gallons of diesel would be used for each acre-foot of water. Diesel fuel would be delivered monthly and stored on-site in 500-1,000 gallon double-walled concrete tanks with spill containment.

Both above- and below-ground irrigation pipelines could be used. If the water delivery system were to be a temporary feature (i.e., 1-3 years) an aboveground system likely would be used. If the site would require periodic applications of water over the lifetime of the LCR MSCP, then a more permanent, belowground water delivery system would be used. Irrigation water also could be supplied via concrete-lined canals. Heavy equipment (articulating scrapers or towed cans) would be used to build up the areas identified for concrete canal systems. Road motor graders would be used to set finish grades. Front-end loaders and end dump trucks would assist with earth moving. Concrete slip forms and concrete trucks would place and form the concrete canal lining. Backhoes/excavators and forklifts would assist where necessary. Backhoes and trenchers would be used to construct irrigation pipelines.

Existing access roads would be used where possible. New access roads would be surfaced with gravel and would be sufficiently wide to allow access by maintenance vehicles and fire-fighting equipment (approximately 18 feet wide). Gravel likely would be transported to the site via dump trucks that hold between 10 and 22 cy of material, although larger, off-road vehicles could be used if necessary. It is estimated that 1-2, 22 cy belly dump truck, 1 front end loader, 1 water truck, and 1 road motor grader would be required to resurface 0.5 mile of road per day. It is estimated that 1 mile of roads per year would be constructed over a 20-30 year period.

Planting Methods

A variety of planting methods would be used, depending upon what was most cost-effective in a particular situation. Hydroseeding involves combining seed and mulch in a water truck with a rotating basket and physically spraying the seed on with a hose. Seed also could be placed in the water source if fields were to be flooded. Pole planting involves augering a hole and then hand or machine planting rooted stock or a cottonwood or willow pole. Another method involves attaching mechanized tree planters to a tractor that cuts a furrow, inserts a tree that has been placed in a biodegradable container into the furrow, and pushes the dirt back in place. Under each method, only one piece of equipment would be required per site. The planting stock would originate from the LCR Valley, and most of it would be acquired from nurseries located in the general project area. Seeds would be collected from the local area.

Fish Rearing

If sufficient numbers of native endangered fishes cannot be produced by existing facilities for reintroduction into suitable LCR mainstream habitats, it is possible that the expansion of existing native fish production facilities would be required. This could involve the construction and maintenance of raceways and growout ponds. If needed, the ponds would be about 5-6 feet deep, lined with clay or plastic, and likely would not exceed 1 acre. The ponds likely would be dug by a crawler with dozer. All of these hatchery facilities would be constructed off-stream and it is possible that they could be above ground if pumping already were needed to provide water to the site, in which case excavation would not be required. This is not likely, however. Construction would likely last about 20-30 days. As needed, fish would be transported to the river in a hatchery truck.

Public Access

Public access to the established conservation areas would be highly restricted in order to protect the habitats and species that use them. Access could be limited by placing a wire cable across access roads, or in some cases fencing might be required. Access would not be restricted to any other portions of the planning area.

Long-Term Maintenance

The following measures would be implemented, as necessary.

- Dredging would be implemented if backwaters and marshes in conservation areas were lost due to flood-induced sedimentation. The description of dredging above is applicable to this measure.
- Land management and habitat establishment measures would be implemented in conservation areas to ensure the reestablishment of native vegetation through active management or natural processes in the event that terrestrial vegetation is lost to fire or other destructive event such as flooding. The types of measures that would be implemented would depend on how recovery proceeds. If the burned area revegetated with cottonwood-willow and mesquite, less active management would be needed. If saltcedar appeared, it would have to be removed, and revegetation generally would proceed as described above, although minimal dirt movement would be required and it is assumed that irrigation infrastructure still would be in place.
- Land management and habitat establishment measures would be implemented in conservation areas to ensure the establishment of the conservation area through active management or natural processes in the event of a toxic or hazardous substance spill. The specific types of measures that would be required would be dependent upon the nature of the spill. It may be necessary to remove soils, detoxify areas, and replant affected vegetation.

Other long-term maintenance actions may include tree trimming, non-native species control, spot replanting, diseased tree treatment, and road maintenance.

Employment

Construction could be performed either by Reclamation or independent contractors. Up to 30 workers could be involved in the construction of individual sites, but they all would not be present at the same time since they would be involved in different phases of work. The number of construction workers required would vary according to the type of construction activity involved. For example, preparing an agricultural site that was already leveled and contained the appropriate infrastructure, would require about three construction workers. Establishing or enhancing a specific habitat at an undeveloped site could take several workers to clear the site and six to eight workers to install infrastructure. Dredges would require two personnel per shift (in the absence of restrictions, dredges may operate 24 hours a day). The number of workers required for planting depends on the methods involved. Augering holes and placing plants in each hole could require 12-24 people. Mechanized tree planting could take 10-12 people.

Long-term maintenance and monitoring needs would require approximately 10 administrative staff; 9 planning, design, and engineering staff; and 8 conservation management and maintenance staff. Additionally, it is anticipated that one new law enforcement officer and one new wildland fire fighter would be provided, respectively, for every 5,000 and 2,500 acres of conserved land not already in public ownership. All new personnel would be stationed at existing facilities. Maintenance, law enforcement, and firefighting staff likely would be drawn from the local population. Monitoring and administrative staff would be stationed elsewhere and would make visits to the project sites as needed.